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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,682	08/18/2003	Mitsuhiko Yamamoto	03481/LH	4603

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FRISHAUF, HOLTZ, GOODMAN & CHICK, PC
220 5TH AVE FL 16
NEW YORK, NY 10001-7708

EXAMINER	
ALEXANDER, MICHAEL P	

ART UNIT	PAPER NUMBER
1742	

DATE MAILED: 11/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/643,682	YAMAMOTO ET AL.	
	Examiner	Art Unit	
	Michael P. Alexander	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 October 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14 and 24-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14 and 24-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *07/26/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-14 and 24-29 are pending. Claims 1-14 were amended and changed the scope of the claims, but the amendment to claims 1-2 and 4-14 did not distinguish over the prior art of record. The amendment to the scope of claim 3 necessitated a new ground for rejection. Claims 24-29 are new.

Election/Restrictions

Applicant's election of Group I in the reply filed on 18 October 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Objections

Claim 3 is objected to because of the following informalities: lines 4-5 recites "a halogen ion selected from the group consisting of sodium chloride, potassium chloride and potassium iodide". However, sodium chloride, potassium chloride and potassium iodide are halide salts not halogen ions. Appropriate correction is required.

Claim 26 is objected to because of the following informalities: claim 26 recites, "wherein the halogen ion is potassium chloride." However, potassium chloride is a halide salt not a halogen ion. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 8-10 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The specification does not describe a chemical treatment method (of claim 8 applied to claims 1 and 5), **wherein the cathode electrolysis reduction step <u>further</u> comprises dipping a portion of the metal film into an <u>etching</u> treatment solution containing a halogen ion**.

Claims 9-10 are rejected in that they include the undisclosed subject matter of claim 8.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 4-9, 11-12, 14, 24-25 and 27-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Wheatley (US 3,915,809).

Regarding claim 1, Wheatley teaches (col. 2 line 20 – col. 3 line 47) a chemical treatment method by which a metal film (col. 2 line 53) formed on a material to be subjected to film formation is etched (col. 3 line 39-41) into a predetermined pattern, comprising: a cathode electrolysis reduction step comprising performing electrolysis

reduction (col. 2 lines 40-49 or col. 2 lines 57-69 or col. 3 lines 3-13 or col. 3 lines 15-26) on a metal film as a cathode by using one of an acidic reduction treatment solution (col. 2 lines 62-65 or col. 3 lines 9-13 or col. 3 lines 20-21) containing an acid radical; and an etching step (col. 3 lines 34-38 or col. 3 lines 39-42) comprising etching the metal film in an etching treatment solution after the cathode electrolysis reduction step.

Regarding claim 2, Wheatley teaches (col. 2 lines 62-65 or col. 3 lines 20-21) that the cathode electrolysis reduction step is carried out with the acidic reduction treatment solution comprising sulfuric acid.

Regarding claims 4 and 24, Wheatley teaches (col. 3 lines 34-38 or col. 3 lines 39-42) that the etching treatment solution contains chloride ions.

Regarding claims 5 and 25, Wheatley teaches (col. 2 lines 20 – col. 3 line 47) a chemical treatment method by which a metal film formed on a material to be subjected to film formation is etched into a predetermined pattern, comprising: a cathode electrolysis reduction step (col. 2 lines 61-65) comprising performing electrolysis reduction on a metal film as a cathode by using a reduction treatment solution containing a chloride ion; and an acid dip step (col. 3 lines 34-38 or col. 3 lines 39-42) comprising dipping the metal film into an acidic etching treatment solution after the cathode electrolysis reduction step.

Regarding claims 6-7, Wheatley teaches (col. 3 lines 34-38 or col. 3 lines 39-42) that the acidic etching treatment solution contains a chloride ion.

Regarding claim 8, Wheatley teaches (col. 3 lines 34-38) that the cathode electrolysis reduction step further comprises dipping a portion of the metal film into an

etching treatment solution containing a halogen ion. In this instance the etching step of step (b) would be the second etching step described in col. 3 lines 39-42.

Regarding claim 9, Wheatley teaches (col. 3 lines 15-17) that the metal formed would be chromium.

Regarding claim 11, Wheatley teaches (col. 2 line 20 – col. 3 line 47) a chemical treatment method by which a metal film formed on a material to be subjected to film formation is etched into a predetermined pattern, comprising dipping a metal film in an acidic treatment solution containing a halogen ion (col. 2 lines 62-65 or col. 3 lines 10-14 or col. 3 lines 34-38 or col. 3 lines 40-42), and performing electrolysis reduction (col. 2 lines 40-49 or col. 2 lines 57-69 or col. 3 lines 3-13 or col. 3 lines 15-26) on the metal film as a cathode.

Regarding claim 12, Wheatley teaches (col. 3 line 15-17) that the metal would be chromium.

Regarding claim 14, Wheatley teaches (col. 2 lines 62-65 or col. 3 lines 10-14 or col. 3 lines 34-38 or col. 3 lines 40-42) that the halogen ion would be a chloride ion.

Regarding claims 27-29, Wheatley teaches (col. 3 lines 3-27) plating chromium onto nickel, which would inherently produce a nickel chrome alloy in the boundary between the two layers.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wheatley as applied to claim 1 above, and further in view of Stareck (US 2,250,556).

Regarding claim 3, Wheatley does not specify that the cathode electrolysis reduction step (i.e. electrodepositing copper, col. 2 lines 57-69) would be carried out with an alkaline reduction treatment solution including sodium chloride. However, Stareck teaches (col. 3 lines 59-75) a method of electrodepositing copper with an alkaline reduction treatment solution including sodium chloride in order to produce a uniform copper deposit. It would have been obvious to one of ordinary skill in the art to modify the method of Wheatley by using an alkaline reduction treatment solution including sodium chloride in order to produce a uniform copper deposit as taught by Stareck.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wheatley in view of Stareck as applied to claim 3 above, and further in view of Westbrook (US 2,931,760).

Wheatley in view of Stareck do not specify that the halide salt would be potassium chloride. However, Westbrook teaches (col. 3 lines 35-43) that sodium chloride and potassium chloride are functional equivalents because the sodium and potassium are merely inert or harmless anions to a copper electroplating process. It would have been obvious to one of ordinary skill in the art to modify the method of Wheatly in view of Stareck by substituting potassium chloride for sodium chloride because potassium chloride and sodium chloride have equal utility as taught by Westbrook.

Claims 10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheatley as applied to claims 1 and 8 above, and further in view of Hidaka et al. (US 5,425,822).

Wheatley does not specify forming a chromium alloy layer. However, Hidaki et al. teach (col. 5 lines 4-14) that carbon increases the wear resistance of chromium. It would have been obvious to one of ordinary skill in the art at the time of the claimed invention to modify the chemical method of Wheatley by adding carbon to the chromium layer in order to increase the wear resistance as taught by Hidaki et al.

Response to Arguments

Applicant's arguments filed 18 October 2005 have been fully considered but they are not persuasive.

Applicant argues that (a) in contrast to Wheatley, applicants' claims 1 and 11 concern a method to etch a metal film uniformly and stably, (b) in constrast to Wheatley, applicants' claim 2 recites that sulfuric acid can be used in the reduction treatment

solution itself, (c) in constrast to Wheatley, applicants' claim 5 can reduce an oxidized film on a metal material to a metal first, and then etch the metal uniformly and stably with an etching treatment solution, (d) that Applicant's claims 10 and 13 contain one of chromium, titanium, tungsten, palladium and molybdenum, whereas Hidaka et al. disclose a chromium alloy which includes nickel, tungsten and molybdenum and more.

With respect to the argument that applicants' claims 1 and 11 concern a method to etch a metal film uniformly and stably in contrast to Wheatley, it is noted that the features upon which applicant relies are not recited in the rejected claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

With respect to the argument that applicants' claim 2 recites that sulfuric acid can be used in the reduction treatment solution itself in contrast to Wheatley which teaches that sulfuric acid is a part of the composition of the chromium plating bath. The Examiner asserts that the chromium plating bath (as well as the copper and nickel plating baths) is a reduction treatment solution. Electrodeposition is the reduction of metal ions from solution which then plate onto a substrate.

With respect to the argument that applicants' claim 5 can reduce an oxidized film on a metal material to a metal first, and then etch the metal uniformly and stably with an etching treatment solution in contrast to Wheatley, it is noted that the features upon which applicant relies are not recited in the rejected claim. Although the claims are

interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

With respect to the argument that Applicant's claims 10 and 13 contain one of chromium, titanium, tungsten, palladium and molybdenum, whereas Hidaka et al. disclose a chromium alloy that includes nickel, tungsten and molybdenum and more, the Examiner disagrees. Applicants' claims 10 and 13 recite "wherein the metal film is formed from an alloy **containing at least one** metal selected from the group consisting of chromium, titanium, tungsten, palladium and molybdenum." The broadest reasonable interpretation of that recitation is that it would include any alloy having chromium, titanium, tungsten, palladium and molybdenum as a component of the alloy, which would include the alloy of Hidaka et al.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael P. Alexander whose telephone number is 571-272-8558. The examiner can normally be reached on M-F 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

mpa

ROY KING
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700